

**Amendments to the Specification:**

Please amend the Specification as follows:

Page 12, Lines 24-26 please replace the paragraph with the following amended paragraph:

Fig. 4 is a schematic illustration of another test system utilizing the position sensor according to the present invention; ~~and~~

Page 12, Lines 27-28 and Page 13, Lines 1-2 please replace the paragraph with the following amended paragraph:

Fig. 5 is a graph of the pulse output for the Wiegand effect material of the position sensor according to the present invention plotting voltage as a function of time -- . -- ;and

Page 13, Line 3 please add the following new paragraph.

Fig. 6 is Table 1 illustrating numerous data from a regressing heat experiment.

Page 19, Lines 22-29 and Page 20, Lines 1-8 please replace the paragraph with the following amended paragraph:

In creating the temperature sensitivity algorithm according to the present invention, heat regression tests were conducted in order to test the resistance and sensitivity for the sensor coils 10 having cores 12 made of Wiegand effect material as a function of temperature as best shown in ~~Appendix~~ Table 1. (Fig. 6) and Figs. 3A and 3B. These tests established values and ranges particular to the position sensor 10 of the present invention. For instance, these predetermined values include a resistance drift value ( $G_r$ ) over a large temperature range (30° to 80° C) for the sensor resistance versus temperature results shown in Fig. 3A and ~~Appendix~~ Table 1 (Fig. 6) and a

sensitivity drift value ( $G_s$ ) over the same 30° to 80° C temperature range for the sensor sensitivity versus temperature results shown in Fig. 3B and ~~Appendix~~ Table 1 (Fig. 6).

Page 20, Lines 9-27 and Page 21, Lines 1-2 please replace the paragraph with the following amended paragraph:

These values were predetermined by testing the effect of the sensor core 12 composition (Wiegand effect material) on the temperature sensitivity for twenty sensors 10 (data from eight position sensors 10 representative of all twenty sensors 10 tested are listed in ~~Appendix~~ Table 1). For this test, each location sensor 10 consisted of a single sensor coil 10 having core 12 made of Weigand effect material. The temperature sensitivity for each of the sensor coils 10, as the position sensor, were tested in an apparatus as schematically shown in Fig. 2. Accordingly, position sensor (sensor coil 10) and thermocouple 22 were inserted into a glass tube 24, which was, in turn, placed in a hot water bath 26. Each sensor coil 10 and thermocouple 22 have wire leads 36 and 38, respectively which are attached to instruments to measure sensor voltage and temperature, respectively. Water was poured into the bath to a level sufficient to submerge each sensor 10. The bath was placed inside a Helmholtz chamber, consisting of three pairs of mutually orthogonal Helmholtz coils.

Page 22, Lines 10-23 please replace the paragraph with the following amended paragraph:

First, since the current ( $I$ ) delivered through each sensor 10 is consistent and uniform (from a 4 KHz signal delivered by the position and orientation system 30 shown in Fig. 4), the voltages read on each sensor 10 at each temperature were converted to a resistance value by signal processor 48.

Resistance drift values  $G_r$  were plotted against temperature as illustrated in Fig. 3A and ~~Appendix~~ Table 1 (Fig. 6). The resistance values (in ohms) were measured at each temperature along the selected temperature range (30° to 80° C) and were converted to the gradient values  $G_r$  (as % drift of resistance), i.e. the percentage difference of a sensor coil resistance at temperature T relative to its resistance at 80°C according to the equation:

Page 24, Lines 12-20 please replace the paragraph with the following amended paragraph:

Based on the testing conducted, a temperature sensitivity algorithm has been created for the location system 30. The data from the testing showed that the resistance change  $b_0$  and the sensitivity change  $a_0$  for the position sensors 10 tested are constants as evidenced by the results in ~~Appendix~~ Table 1 (Fig. 6) and Figs 3A and 3B. Both of these constants ( $a_0$  and  $b_0$ ) are stored in the memory of the signal processor 48 for the location system 30.